Please contact us if you...

- need help developing a practical solution to a challenging technical intelligence problem
- are interested in pursuing a graduate education with relevant, tailored coursework and an intelligence-focused research project
- require guidance from cleared, trusted subject-matter experts

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OUR MISSION
AFIT’s Center for Technical Intelligence Studies & Research (CTISR) promotes innovation and enhances capabilities within the technical intelligence (TI) and ISR communities through graduate-level research and workforce development in collaboration with government, academic, and the private sector.

OUR VISION
Establish AFIT as the producer of the technical intelligence community’s most sought-after military and civilian graduate students.

WHO WE ARE
CTISR is a research center bringing together cleared faculty across academic departments to solve difficult, multi-disciplinary technical intelligence problems. Several current research projects include: dim target detection and tracking; sensor data fusion for TI enhancement; understanding target signature phenomenology and remote sensing platforms for enhanced exploitation of intelligence data. CTISR is also spearheading a business model which will enable defense contractors and government civilians to cost-effectively educate the next-generation scientific and technical intelligence workforce.

CORE COMPETENCIES
- remote sensing & imaging science
- spectroscopy & radiative transfer
- hyperspectral imaging
- combustion measurement & modeling
- optical design & sensor modeling
- atmospheric compensation
- statistical methods & machine learning for data reduction and predictive modeling
- algorithm development
- signal & image processing
- EO/IR systems
- data fusion

CTISR REMOTE SENSING

Measure battle space signatures
- Historical focus on dynamic combustion
- High-explosive detonations
- Muzzle flashes (tanks, hand guns, ...)
- Rocket plumes, aircraft exhaust, smokestacks
- Laboratory combustion diagnostics
- Recent efforts in traditional and novel HSI with emphasis in robust material identification
- Combustion diagnostics, and flow visualization
- Instrument suite (rugged, field-deployable)
  - Radiometers (100 Hz - 100 kHz)
  - Imagers (128x128, 256x256)
  - Imaging spectrometers (256x256 with linear polarimetric resolution - 2.4m-850 nm)

Build phenomenological models
- Reduce dimensionality / extract key features using physics-based models
- Characterize / classify event type based on properly-interpreted signature

Develop instrument prototypes
- Chromotomograph - hyperspectral video, was SERB-ranked ISS space experiment
- Passive ranging - tunable bandpass filter system for range estimation (762 nm C1, 10-30 km)

HYPERSPECTRAL IMAGING

INDUSTRY PARTNERS

SPECTRAL SCIENCES INC.
RIVERSIDE RESEARCH
ALTAMIRA

Textures & Values to IC and DoD
- Generate military and civilian students academically and practically prepared to join the IC workforce
- Execute academic research on intelligence problems via cross-department multi-disciplinary approach
- Provide SME as government-trusted agent for testing & validation of new ideas, algorithms, or hardware
- Offer an academic environment unconstrained by the IC’s ops tempo: deeply explore and creatively solve the hardest technical intelligence problems